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Capstone Project Title Approval Form

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Proponents

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Proposed Capstone Project Title

SecureGuard: Advanced Home Security with Arduino-Powered Sensors

Homeowners/Residential Builders and Developers

Platform

Web-based/Android Application/Firebase Cloud/Arduino IDe/

Background of the Organization/Firm/Target Pilot Area

SecureGuard is dedicated to enhancing the lives of homeowners who rely solely on manual locks to protect their properties. Despite the convenience of smart technology, the threat of theft and burglary persists. Many homeowners remain vulnerable to intrusions as traditional security measures often prove inadequate against sophisticated thieves.

In response to this challenge, Smart Home Innovations is committed to developing innovative solutions that combat theft and bolster security in homes dependent on manual locks. By employing advanced sensors and real-time monitoring capabilities, SecureGuard aims to provide homeowners with a robust anti-theft system that fortifies their properties against intruders.

Through our innovative approach, we aim to redefine the standards of home security, granting homeowners the confidence that their dwellings are shielded from theft and intrusion. Smart Home Innovations is dedicated to making homes safer and more secure, ensuring peace of mind for homeowners everywhere as they safeguard their valuable belongings. Join us as we work towards a future where theft is no longer a concern for homeowners relying on manual locks.

Problem Statement		
Problems	***Causes***	***Solutions (As a Feature of your System***
Rising Incidences of Theft and Burglary	Increasing occurrences of theft and burglary result from inadequate traditional security systems. These systems often lack comprehensive coverage and real-time monitoring, leaving homes vulnerable to intruders.	To combat rising theft and burglary rates, SecureGuard integrates advanced door and window sensors with real-time monitoring capabilities. This proactive approach enhances home security by detecting unauthorized access attempts and alerting homeowners immediately, reducing the likelihood of theft and burglary incidents.
Reliance on Manual Locks for Home Security	The organization's current reliance on manual locks for door and window security leaves properties vulnerable to intruders. Manual locks lack sophistication and cannot provide real-time monitoring or immediate alerts in case of unauthorized access attempts.	To address the organization's reliance on manual locks, SecureGuard proposes the integration of advanced Arduino-powered sensors on doors and windows. These sensors offer comprehensive coverage and enable real-time monitoring of entry points. By providing instant alerts in the event of unauthorized access, SecureGuard enhances the security of the organization's properties, mitigating the risk of theft and burglary.
Forgetfulness Leading to Unsecured Doors and Windows	Instances of forgotten door and window locks contribute to the vulnerability of the organization's properties. Human error and forgetfulness often result in leaving entry points unsecured, creating	SecureGuard addresses this issue by implementing automated door and window sensors powered by Arduino technology. These sensors detect the status of locks and provide immediate alerts to homeowners or property managers in case of

	opportunities for intruders to gain unauthorized access.	oversight. By automating the monitoring process, SecureGuard ensures that doors and windows remain secured at all times, minimizing the risk of unauthorized access due to forgetfulness.
Limited Awareness of Home Intrusions When Away	When individuals are not at home, they may only realize they've been robbed when they return and notice missing items. Without real-time monitoring, there's no immediate way to detect intrusions and take preventive action.	Implementing a system like SecureGuard with automated sensors for doors and windows allows homeowners to receive immediate notifications of unauthorized access, even when they're away. This proactive approach enables individuals to take precautionary measures to prevent thefts as soon as they occur, enhancing home security and peace of mind.

Objectives

The primary objectives of the "SecureGuard: Arduino-Powered Anti-Theft Smart Home Solution with Comprehensive Door and Window Sensors" project are to elevate home security by overcoming limitations in traditional measures. The project focuses on providing extensive coverage through the integration of door and window sensors powered by Arduino technology. Real-time monitoring capabilities will be facilitated through an intuitive web-based platform, empowering homeowners with immediate insights and alerts. Additionally, seamless integration with Firebase aims to enhance data management, while a commitment to sustainability ensures responsible and eco-friendly smart home solutions. "SecureGuard" strives to set new benchmarks in residential security by offering a comprehensive, user-friendly, and sustainable anti-theft solution.

Specific Objectives

1. Elevate Home Security:
   - Enhance home security by overcoming limitations in traditional measures.
2. Comprehensive Sensor Deployment:
   - Develop Arduino-powered sensors for doors and windows to ensure comprehensive coverage.
3. Real-Time Monitoring Platform:
   - Establish an intuitive web-based platform for immediate monitoring of security events.
4. Instant Notification System:
   - Implement an instant notification system to alert homeowners to potential threats swiftly.
5. Promote Sustainability:
   - Incorporate sustainable and eco-friendly features for responsible smart living.

Specific Functions and Features

1. Arduino-Powered Sensors:
   - Function: Detect unauthorized access attempts.
   - Feature: Comprehensive coverage of doors and windows.
2. Multi-User Access Control:
   - Function: Manage access permissions for multiple users.
   - Feature: Customizable user roles and access levels for enhanced security.
3. Real-Time Monitoring Platform:
   - Function: Provide immediate insights into security events.
   - Feature: User-friendly interface for intuitive monitoring.
4. Remote Arm/Disarm Functionality:
   - Function: Arm or disarm the security system remotely.
   - Feature: Convenient control of security settings via mobile app or web interface.
5. Activity Log and Reporting:
   - Function: Maintain a log of security-related activities and events.
   - Feature: Detailed reports and analytics for monitoring and analysis purposes.
6. Firebase Integration:
   - Function: Enhance data storage and retrieval.
   - Feature: Seamless communication between devices and platform.
7. Instant Notification System:
   - Function: Alert homeowners to potential threats instantly.
   - Feature: Swift response for proactive security measures.

8. Sustainable Design:
   - Function: Incorporate eco-friendly practices.
   - Feature: Energy-efficient operation for responsible smart living.

Significance and Possible Users

Significance:

- Efficient Water Resource Management: HydroAlert provides timely insights and alerts, enabling optimized water usage, reducing waste, and promoting sustainability.
- Risk Mitigation: Automated alerts help mitigate potential damage by providing early warnings about rising water levels and heavy rainfall.
- Smart Living Integration: HydroAlert seamlessly integrates with popular smart home platforms, enhancing the overall intelligence and convenience of modern residential environments.
- Community Engagement: Features such as community data sharing foster a sense of environmental responsibility and collective awareness.

Possible Users:

- Homeowners and Residents: Individuals seeking to make informed decisions about water conditions around their homes for efficient resource management.
- Smart Home Enthusiasts: Those invested in smart home technologies can seamlessly integrate HydroAlert into existing systems for a more comprehensive living experience.

Level of Feasibility

Technical Feasibility

Utilization of Established Technologies:

- The proposed system leverages well-established technologies, including Arduino for sensor development, web platforms for real-time monitoring, and Firebase for data management.

Robust Documentation and Support:

- These technologies boast extensive documentation and robust support networks, ensuring smooth integration and reliable functionality throughout the development process.

Flexibility of Arduino:

- Arduino's inherent flexibility facilitates sensor customization, enabling comprehensive coverage of door and window entry points tailored to specific security needs.

Real-Time Monitoring Platform:

- SecureGuard integrates a real-time monitoring platform, enabling users to receive immediate updates on security events, enhancing situational awareness.

Instant Notification System:

- An instant notification system is seamlessly integrated, ensuring homeowners are promptly alerted to potential security threats via various communication channels.

Security and Privacy:

- Stringent security and privacy measures are implemented to safeguard user data and ensure compliance with privacy regulations, fostering trust and confidence among users.

Testing and Validation:

- Rigorous testing and validation procedures are conducted at each stage of development to ensure the reliability, effectiveness, and resilience of SecureGuard in real-world scenarios.

Operational Feasibility:

User-Friendly Interface:

- SecureGuard offers a user-friendly interface accessible via web and mobile platforms, ensuring hassle-free setup and monitoring for homeowners and property managers.

Seamless Integration:

- The system seamlessly integrates with existing smart home ecosystems, ensuring operational compatibility and enhancing user experience without requiring significant changes or additional hardware.

Instant Response Mechanism:

- SecureGuard's instant notification system enables swift responses to potential security threats, improving operational efficiency in mitigating security risks and minimizing potential losses.

24/7 Monitoring Capability:

- With round-the-clock monitoring capability, SecureGuard provides homeowners with peace of mind, even when they are away from their properties.

Scalability:

- Designed to be scalable, SecureGuard allows for easy expansion to accommodate additional sensors or devices as the user's security needs evolve over time.

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Santa Cruz Campus:
BS Information Systems
(AACCUP, Inc. Reaccredited Level 2)

For Review Committee Only	
Comments:	
Status: ☐ For Revision ☐ Approved ☐ Disapproved	_____ Signature Over Printed Name

Note: You may attach the results of your survey and feasibility analysis, if needed.